Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)
	)
WIRELESS BROADBAND ACCESS	) **GN Docket No. 04-163**
TASK FORCE SEEKS PUBLIC	)
COMMENT ON ISSUES RELATED TO	)
COMMISSION'S WIRELESS	)
BROADBAND POLICIES	)

ALVARION COMMENTS TO
Public Notice DA 04-1266

I.   INTRODUCTION

Alvarion appreciates the opportunity to offer comments with respect to the FCC's Wireless Broadband Task Force Public Notice seeking input on current spectral and regulatory issues concerning wireless broadband service and how they impact current service offerings and will in the future.

Alvarion is the world's leading pure play provider of wireless broadband solutions and we are a very pro-active leader. We develop and market carrier-class solutions from 800 MHz to 26 GHz, covering applications as diverse as high-speed Internet access, TDM voice, cellular backhaul, mobile broadband, public hotspots, and enterprise bridging. While Alvarion's leadership may be measured in units deployed (more than 1.5 million), countries deployed (over 125), and most any other significant metric, Alvarion has also been a principal leader in the wireless standards development process from the first IEEE 802.11 WLAN standard to the recent IEEE 802.16.

From Iceland to Chile, from India to Ireland, from Namibia to Russia, from Cambodia to New Zealand, the globe's largest wireless broadband deployments in almost every region are Alvarion based. In the U.S., approximately 200 telephone companies, 80 utilities, 1,000 ISPs, many municipalities, several large regional cellular carriers, and a number of cable MSO's are delivering wireless broadband services to several hundred thousand subscribers using Alvarion's BreezeACCESS multi-point solution. BreezeACCESS integrates 900 MHz, 2.4 GHz, MMDS, 3.5 GHz, and multiple 5 GHz bands into a single solution with end user speeds from 3Mbps to 24 Mbps. Significant deployments can be found in

markets as rural as Jefferson County, Nebraska with a population as of only 8,250, but where Diode Communications has over 1,000 fixed wireless broadband customers to as metro as San Diego County, California, where over 500 sheriff's deputy vehicles have mobile broadband access.

Accordingly, as a market leader, Alvarion accepts the responsibility and respectfully offers the following comments to the Commission.

II.　　RESPONSE TO QUESTIONS

1. **To what extent are both licensed and unlicensed wireless broadband networks providing an alternative facilities-based platform to other broadband services, including cable and DSL? To what extent have wireless broadband service providers increased broadband access and competition in rural and underserved areas? If so, are regulatory changes needed to promote or advance these trends?**

   Alvarion estimates there are approximately 1 million wireless broadband subscribers, licensed and unlicensed, within the U.S., with the vast majority being unlicensed. Exact numbers are difficult to quantify since the FCC Broadband Reporting requires only operators with 250 or more subscribers to report and the vast majority of unlicensed WISPs have fewer than 250 subscribers. Alvarion estimates there are approximately 2,000 operators of all types providing some degree of wireless broadband services, but fewer than 20 have amassed over 1,000 subscribers.

   As of May 2004, there were about 31 million U.S. households with broadband. Viewed against this number, 1 million subscribers for wireless broadband seem nominal. However, consider that that vast majority of the wireless broadband subscribers are in rural markets where less than 25% of the general population resides. As well, broadband penetration is lower in general in these rural markets. Viewed against this perspective, we assert that wireless broadband may account for up to 10% of current rural broadband subscribers.

   It should also be noted that many of the providers of wireless broadband are the same providers of DSL. For example, about 200 small LECs deploy Alvarion wireless broadband solutions in concert with their DSL roll-out. In other words, the technologies are not necessarily

mutually exclusive.

As a short answer to what the Commission can do to advance wireless broadband, it can seek to harmonize spectrum allocation with other major regulatory domains. Second, it should structure rules that promote innovation by steering clear of static type rules (e.g. x type modulations only) and avoiding rules that make all systems equal, regardless of their efficiency. For example, the current Part 15 rules have no mechanism for rewarding efficient products or penalizing spectrally "unfriendly" products. This is leading to the proliferation of inefficient, noisy products that are easy to produce and cheap to make. Such products are weighted equally in the current rules. The result is less efficient use of the spectrum and fewer operators being able to co-locate within a given market. In other words, the unlicensed spectrum ends up becoming "dumbed down" and the incentive for vendors to innovate is eroded.

2. **Does the Commission currently provide sufficient spectrum suitable for wireless broadband networks? Is the relative availability of spectrum for licensed services or unlicensed devices appropriate? If not, how so?**

The amount of unlicensed spectrum is sufficient, but the location of that spectrum is not. Because current spectrum usable for wireless broadband, especially in the unlicensed application, is mostly above 5GHz, plus the 26MHz of congested band in 900MHz and the Wi-Fi band of 2.4GHz-2.4835GHz, operators are forced into highly complex mixed band architectures with multiple modulations to provide adequate coverage and capacity. The simple physics of 5GHz, regardless of whatever advanced modulation may be applied, prevents customer self-install models and/or meaningful coverage in even moderately foliated markets.

What is needed, whether licensed or unlicensed, is a range of least 75MHz in a sub-1GHz band with at least 4 watts EIRP. (If such an allocation were unlicensed, efficiency promoting rules would be a necessity. Without such rules, allocating such band would be pointless, as it would be quickly saturated with cheap, inefficient systems.) Such a range of band will permit true self-install models enabling economical deployment of wireless broadband in even the most rural of terrains.

Current allocations for licensed spectrum are insufficient, especially if the FCC wishes to promote a third broadband technology in larger metro markets in the interest of increased service offerings and competition. It is important to point out that there are a fair number of operators that do have licensed spectrum that is not being used for cellular or PCS services, yet the majority of those spectrum blocks are very small and inconsistent from operator to operator, or even from BTA to BTA for any one operator. This disarray of non-uniform spectrum that could be used for WBA service prevents equipment vendors from being able to build a common set of equipment at the costs required to meet the operator's business models.

3. **Do the services offered using unlicensed devices and those using licensed networks complement each other? If so, how?**

   While in a theoretical sense, they may compliment, in practice this is seldom seen, except where licensed band point-to-point is used to add a carrier-class level backbone feeding unlicensed multipoint cells. Only a few examples exist where both licensed and unlicensed are used for multipoint within a combined network, such as Arizona-based Commspeed or South Dakota-based Sioux Valley Wireless. However, even in these implementations, the bands are not generally mixed within the same cells. In practice, operators with access to licensed bands do not employ unlicensed and unlicensed operators generally do not have access to spectrum.

   Licensed will always be seen, quite legitimately, as a higher grade deployment and licensed operators still tend to view unlicensed equipment as a second-class citizen to licensed equipment. Since some unlicensed products tend to be far less expensive than licensed, barriers to entry are few for an unlicensed operator resulting in a wide gap between the quality of services offered by a wide variety of operators. For the buying public, choosing an unlicensed wireless broadband provider is really "caveat emptor," whereas a licensed deployment is generally true carrier-class in nature.

4. **There are several different regulatory approaches that determine access to the spectrum for wireless broadband service providers. Service providers using networks composed of unlicensed devices do not pay for access to the spectrum, but must not cause interference and must share the spectrum with other operators of unlicensed devices, whereas access**

to other spectrum is obtained through licensing after successful bidding at auction. In addition, some spectrum has been made available on a first come, first served basis. Has the method for access to spectrum affected the development of wireless technologies and the provisioning of wireless broadband services? If so, how?

First, a point of clarification, unlicensed devices are allowed to use the spectrum on non-interference basis with respect to primary licensed users of the band, not to other unlicensed users of the band.

The access to available spectrum is at extreme ends of the scale. Currently the premium spectrum is allocated using the auction process at prices typically out of the range of most rural operators. (Keep in mind that even the large operators that win licensed in rural areas may not serve those areas for long periods of time because of the economics of offering service to the metro areas first.) And at the other end of the scale, unlicensed bands are available to all at no cost, yet are used by everything from garage door openers, to cordless telephones, to wireless LAN devices. The first come first served spectrum is typically in frequency ranges not suitable for large area wireless broadband services. The point is, those that can afford high price spectrum are obligated by economics to service the large metro areas to recover their CAPEX, and those that can not afford licensed spectrum make use of unlicensed spectrum and deal with the risks for interference as best they can. Clearly, an allocation of spectrum, in a frequency range ideal for wireless broadband services, and uniformly allocated across the nation just for wireless broadband services, would promote the provisioning of wireless broadband services. Two key points to address the level of acceptance is, 1) the spectrum, if made available as licensed, would require using mechanisms that place the burden on the operators abilities to deploy WBA services rather than how much money they can come up with to obtain the spectrum (we all have seen what happens to those that over extend themselves in just acquiring spectrum.), and 2) if offered as unlicensed, the rules must be such to promote the use for WBA services and reduce the risks brought on by other unlicensed devices unfriendly, non-efficient use of the spectrum.

5. **Wireless broadband offers clear advantages over other broadband alternatives in terms of both portability and mobility. Do the Commission's rules effectively provide for or**

account for these capabilities? Could these rules be more flexible? If so, how?

We feel the most important issue to offering portable and mobile services is the cost effective use of the spectrum. Specifically, if the spectrum to be used for such services did not have favorable propagation characteristics or if the EIRP was limited in such that the propagation range was very limited, then in either case the required infrastructure to support that network would be extensive and cost prohibitive. The value of any mobile/portable service is that it is offered at all the locations where the consumer expects to be. Today, we have broadband services available in hot spots and wideband services available in metro areas. The range of the hot spot technologies are short and would require tens of thousands of access points to cover a large area. The cost of installing and provisioning back haul would be extreme. The wideband services, only serve the metro areas and can not offer broadband speeds, also their primary use of spectrum is for voice services, not data. The Commissions rules for unlicensed spectrum are not adequate to offer large enough coverage areas to mobile devices at costs attractive for large scale deployments. Either higher EIPRs and/or spectrum with propagation characteristics favorable to mobile/portable services are needed.

6. **Are there regulatory incentives that would foster continued investment in and deployment of state-of-the-art technologies? If so, what are they? Are the incentives different for licensed services as compared with services offered using unlicensed devices?**

One major incentive that would apply across both licensed and unlicensed bands would be rules and allocations more consistent with other major regulatory regimes. Many excellent technologies and systems exist and are being deployed in other regions, but not in the U.S. The major example is 3.5GHz, but others exist as well, such as the LMDS bands, where the U.S. rules deviate considerably from the rest of the world.

Within unlicensed, once again, rules that would provide benefits to operators using more efficient systems would be a significant motivator for innovation.

7. **We seek comment on the extent and nature of the deployment of wireless broadband services. For example, we are interested in data regarding market penetration rates; the geographic distribution of wireless broadband services; the extent of competition in the**

areas in which wireless broadband is deployed; and whether licensed services, unlicensed devices, or a combination of both licensed service and unlicensed devices are used; and the types of technologies used in the networks deployed.

Alvarion estimates that there are about 1 million fixed BWA subscribers in the U.S. today. Official broadband estimates today place penetration of broadband into U.S. households at approximately 31 million. Measured against this total, 1 million may not sound interesting. But, consider that the vast majority of those 1 million wireless broadband subscribers exist in the rural market, where only about 20M of those households are found, and you discover the very real possibility that BWA may account for 5% of rural connections. Suddenly, that makes the story more interesting, especially since this all happened during a period or horribly constrained capital spending in the telecom arena, without subsidy, without regulatory support, and with mostly novice providers. This can all be belittled, but it can be viewed as a clear trend and as a significant shift from legacy telecom paradigms.

In terms of types of technologies deployed in the U.S., the vast majority are license exempt systems operating in 900MHz, 2.4GHz, and 5.8GHz. The most recent data is from Skylight Research (http://www.skylightresearch.com/ which focuses solely on the wireless broadband market) titled, "Broadband Wireless Market Point-to-Multipoint Under 10GHz – State of the Market 2003-2008" presents extremely detailed information on the U.S. market today and is the most comprehensive report issued to date on the topic. Skylight breaks down sales over the past several years by technology (CDMA, TDMA, spread spectrum, OFDM, other), by band, and by manufacturer. Alvarion recommends the Commission obtain the report, which was produced independently from any vendor, since it presents the clearest picture to date of the global and U.S. market. According to page 44 of the report, Alvarion held 27.5% of the U.S. BWA market (by far the highest share by a single vendor), Waverider 9.4%, Axxcelera 4%, Navini 3.8%, NextNet 2.9%, Vyyo 1.4%, and Nokia .8%. Several vendors are grouped per their request to limit competitive study. According to the report, the group comprised of Remec, SR Telecom, Cambridge Broadband, Airspan, WiLAN, Aperto, and Redline have a combined U.S. market share of 7%. The group consisting of Trango, Motorola Canopy, IP Wireless, and Proxim have a combined share of 32.4%. A remaining "all others" are given 10.9%.

Based on these numbers, since most vendors market a single technology, the FCC is able to build a good picture of what technologies are being deployed, and how much is unlicensed. Alvarion would be an exception, since it markets both spread spectrum and OFDM systems.

8. **With the continued development of new technologies and network configurations, including mesh networks and integrated wireless broadband networks and devices that use both licensed and unlicensed spectrum, are there any rules that require review for updating or increased flexibility?**

We can only reiterate what was stated in the previous paragraphs where wireless broadband will flourish to new levels given spectrum dedicated to that purpose and at frequencies and power levels that permit wireless broadband services to be competitive to wire line services and cellular/PCS wideband offerings.

9. **We also seek comment on the types of applications associated with wireless broadband deployment.**

What types of applications are or will be offered over wireless broadband networks? Are they similar to the applications of the wired Internet (email and web surfing), or are other, more personalized, niche applications being developed? Do the applications differ between licensed and unlicensed networks? What is the relationship between network operators and content providers?

Applications largely mirror those over wire. Wireless is seen as just another means to reach the customer for similar services. There is little to no relationship today with wireless network operators and content providers.

What are typically available data rates, and at what pace are they increasing?

Please see the attachment "Big Advice for Small WISPs" showing the bandwidth models of seven (7) top U.S. wireless broadband operators, as well as the associated fees. This paper also give an idea of the services being offered using wireless broadband.

Is the traffic associated with wireless broadband more typically symmetric or asymmetric?

Does the relative distribution of these traffic patterns affect the required bandwidth for wireless broadband systems? If so, how?

In general, our data shows that when divided across all time, the amount of dedicated bandwidth required per user is approximately 25kbps with clear trends toward 40kbps (these rates are averaged overtime and take into consideration over-subscription rates and user online/offline ratios.) Traffic remains bursty and asymmetric, with higher downstream rates. One effect is that FDD systems may be seen as inefficient use of spectrum where traffic is mostly for Internet data applications.

What is the distribution of wireless broadband between fixed, mobile, and portable installations?

Almost all deployments today, as a percentage, are fixed. While Alvarion has a few dozen full mobile deployments, most are small scale and account for a small fraction of total deployments.

10. **While we are interested in these deployment data across larger geographic regions and on an aggregate basis, we are also interested in information about wireless broadband deployment in specific communities -- rural or urban, large or small, and in varied geographic regions. With a view toward using successful deployments as models or examples for other service providers or communities, have there been pilot or full-scale programs that have been particularly innovative or successful in terms of increasing access to broadband through wireless facilities?**

Yes, as stated in our introduction, section 7 of these comments, and the attachment "Big Advice for Small WISPs." These are but a few examples of successful deployments of wireless broadband. Alvarion would be pleased to facilitate further discussion directly with the WBA operators to allow the Commission to gain greater understanding of the economic issues facing these operators and their customer base.

11. **Are there ways in which federal wireless broadband policies could facilitate better available policy options for states and municipalities? If so, how?**

We have no comment on this section.

12. What barriers (information, infrastructure) to entry remain for WISP entrepreneurs particularly for unlicensed services? To the extent identified, how can government address these issues?

The government should consider allocating spectrum dedicated to the purpose of wireless broadband services and making this spectrum attainable to WISP entrepreneurs. And as stated earlier the spectrum must be at frequencies and power levels that permit these services to be competitive to wire line services and cellular/PCS wideband offerings.

III. CLOSING

In closing, Alvarion appreciates the Commissions actions to be progressive and consider the requirements of wireless broadband services. We look forward to the Commission catering to the needs of operators deploying wireless broadband systems, and furthering services with the same reliability and offerings as their wire line peers.

As always, Alvarion is pleased to be a party to this comment process, and we look forward to participating in future comment processes.

Respectfully submitted,

/s/ Duane Buddrius

Duane Buddrius
Director Product Engineering and Product Management
Alvarion, Inc.
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Carlsbad, CA 92008

[attachment follows]

Big Advice for Small WISPs:

Operators With 1,000+ CPE Offer Their Advice

Patrick Leary
AVP Marketing, Alvarion, Inc.
Patrick.leary@alvarion.com
March 2004

The Operators:

- AMA*Techtel - TX

- Sting Communications - PA

- Diode - NE

- OMU – KY

- Midwest Wireless – MN

- Wabash Telephone – OH

- Wheatland Broadband - KS

The Ground Rules:

1. I asked for their top 5 words of wisdom for small WISPs.

2. I did not coach or ask for any particular angle.

3. I did not ask them to pump Alvarion!

4. I told them I'd quote them verbatim. No word deletions. No word additions.

5. I asked them to also submit their service tiers.

6. All other information and/or graphics are those I already had or pulled off their public web sites.

Who is AMA * Techtel?

- Privately held ISP, now a CLEC, in Amarillo, TX

- Offers Internet and VPN services

- Achieved rapid return on investment

- Covering 20,000 square miles

- Almost 6,000 CPE installed, including 300 BreezeACCESS VL

- Deploying BreezeACCESS Complete Spectrum™

alvarion
We're on your wavelength.
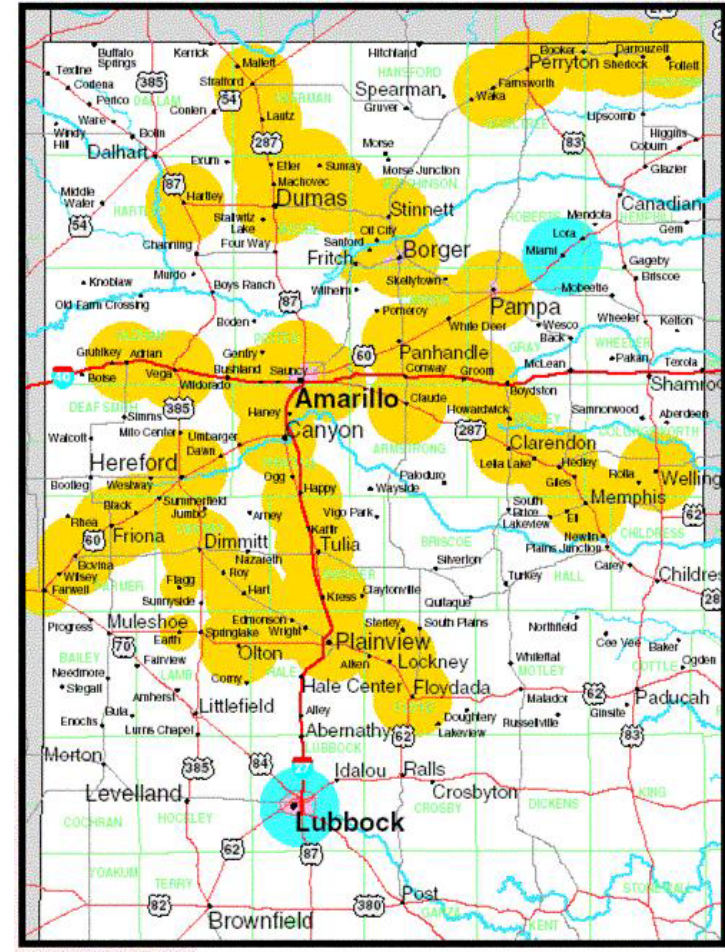
AMA·TechTel

www.amatechtel.com

AMA*Techtel's Tower Sites and Backhauls

- **69 towers**
- **79 backhauls**
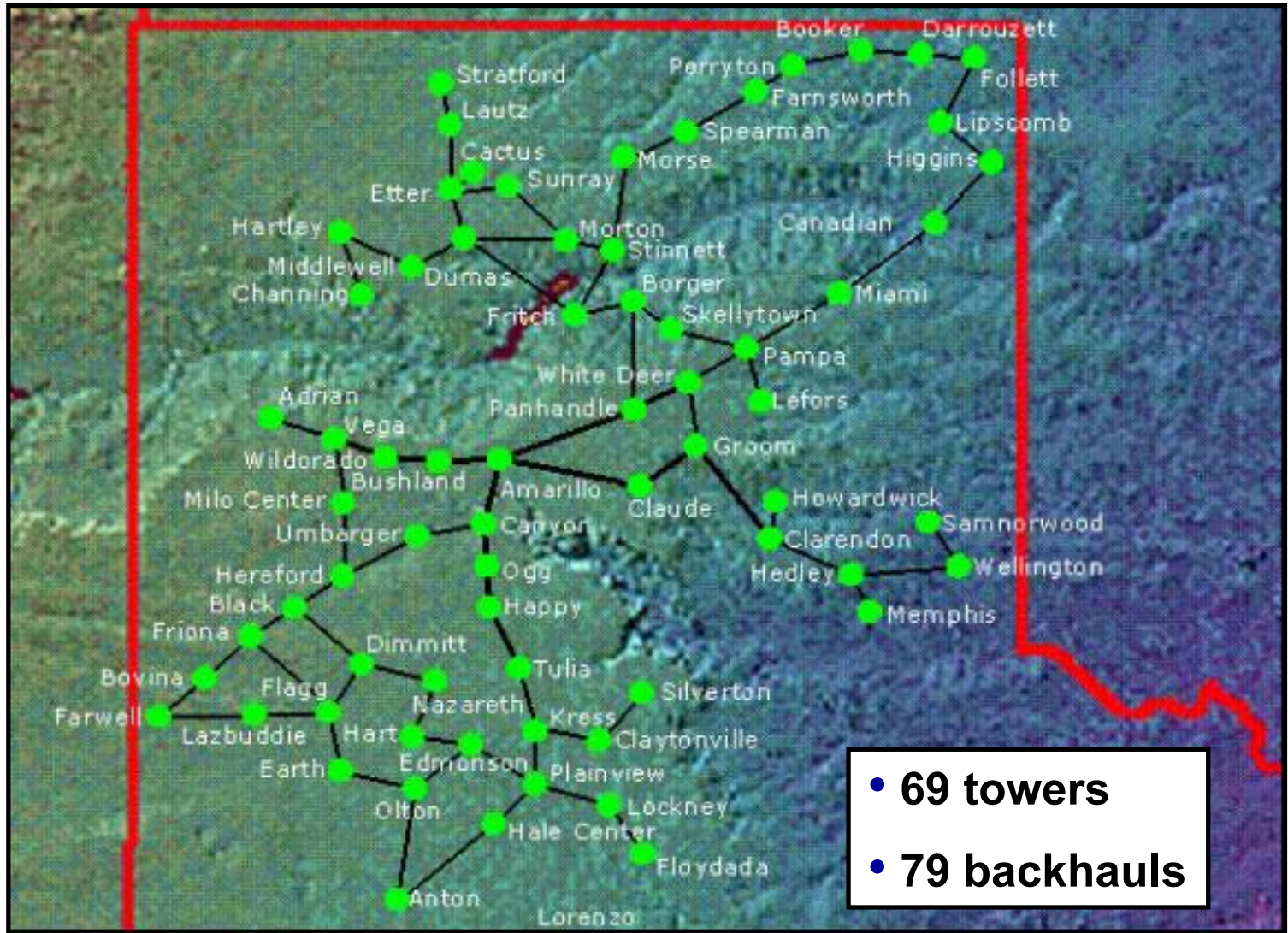
What AMA*Techtel Sells

In our markets for broadband, residential is:

- 384K down/200K up $49.95 in metro areas
                                          $44.95 in rural areas
- 1.1Mb down/200K up $59.95 in metro areas
                                          $54.95 in rural areas

Business is the same in all markets as follows:

- 512K down/200K up $79.90 or $69.90 (depends on contract)
- 768K down/200K up $99.90 or $89.90
- 1.1Mb down/512K up $159.90 or 149.90
- 2Mb down/1.1Mb up $299.00 or $269.00

"We are also bundling services such as our Voice, LD, and Broadband at either $59.95 to $79.95 per month for residential based upon location. This is going very well for the most part."

AMA*Techtel's Advice

- **"Build it right from the start and strive to have your network at 99.999%**

- **Solid service from your vendor is paramount.**

- **Don't be penny wise and dollar foolish.**

- **Your customer is the reason you are in business.**

- **Current customers are more important than new customers. We only get one chance to do it right."**

Courtesy of Douglas Campbell, Chief Operating Officer

Who is Sting Communications?

- Provide wireless services to about 100 towns in Pennsylvania

- Provides sub-T1 to 480Mbps connections

- Top 5 USA WISP

- Over Alvarion-based 1,000 subscribers

- Experts at leveraging grants, e-Rate funding, and RUS programs

- Expanding into neighboring states

- Deploying BreezeACCESS Complete Spectrum™

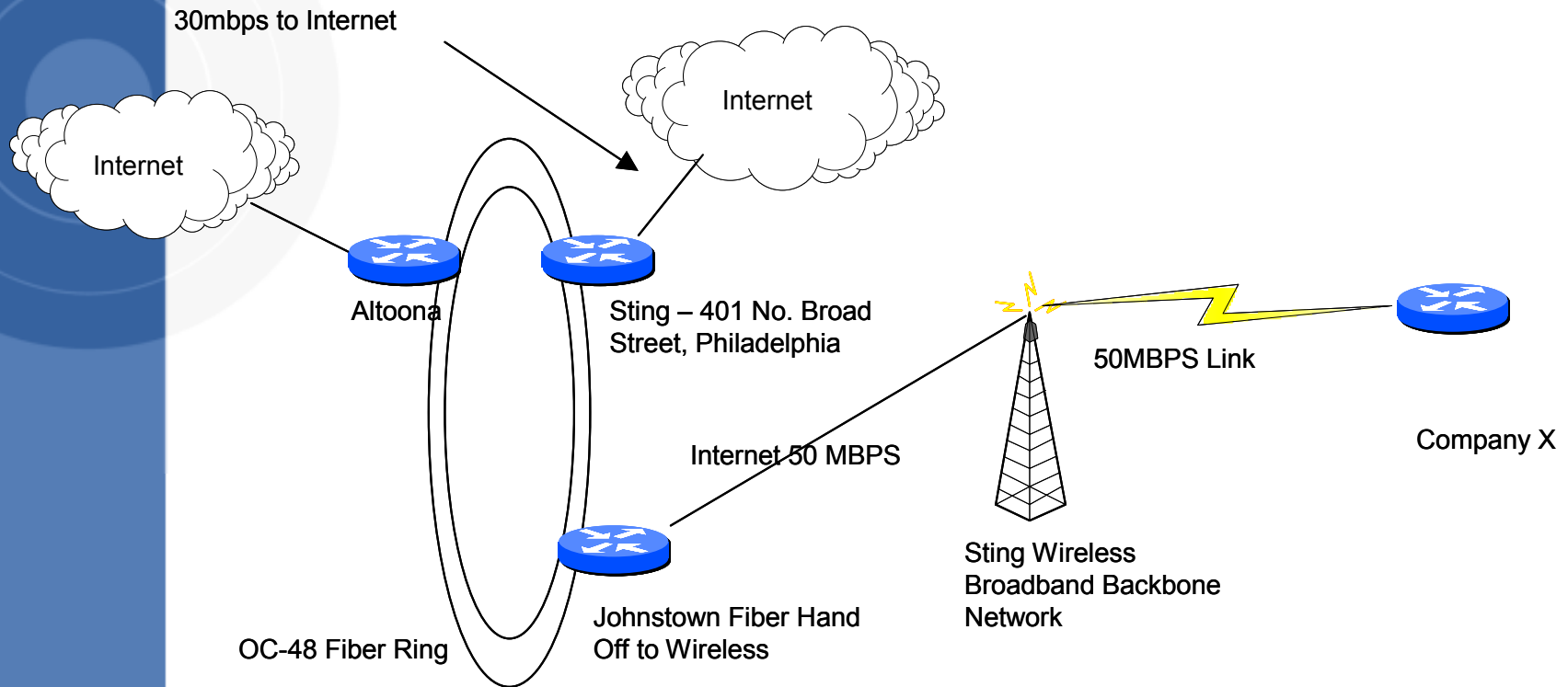B.R.A.I.N. Phase One
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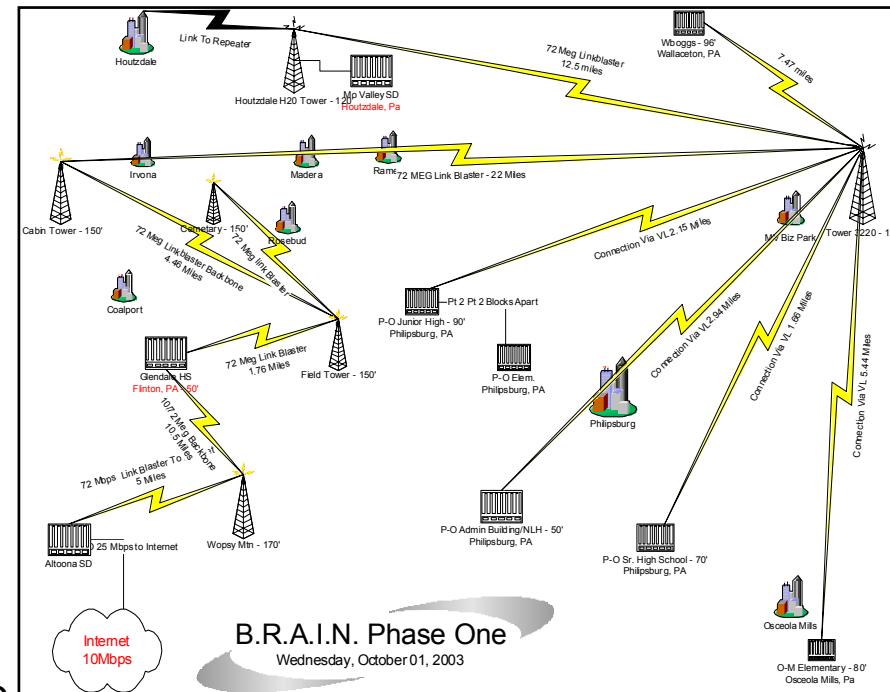
What Sting Sells

Residential speeds to DS3 or even 480 Mbps private networks.

- Virtual Private Networks (VPN)
- Multi-point or Point-Point Private Networks
- Hybrid Networks
- High Speed Internet Connections (256K – T1)
- Campus & Metropolitan Area Networks
- Wireless Network Design Services

Sample Sting Application

30mbps to Internet

Internet

Internet

Altoona

Sting – 401 No. Broad Street, Philadelphia

50MBPS Link

Internet 50 MBPS

Company X

Sting Wireless Broadband Backbone Network

Johnstown Fiber Hand Off to Wireless

OC-48 Fiber Ring

STING communications

Sting's Advice (part 1)

"1) Pick something to be the Best at and Stick with It (don't try to do anything and everything with the word "wireless" in it).

2) Build your network with the "end" in mind (planning is critical).

3) Partner - Partner - Partner (you aren't going very far all by yourself).

4) Don't get caught up selling technology (you are solving problems for your customers - the technology is simply a means to an end).

5) I agree with everything Douglas says…"

Courtesy of Darol Lain, President

Sting's Advice (part 2)

- "Focus on higher bandwidth commercial applications where the economics for wireless really shine.
- Don't be media myopic. Wireless may be your core media, but you are selling bandwidth and applications, not wireless.
- Never buy single units, always buy and negotiate in the highest volume you can.
- Partnerships are key and include your equipment vendor, backhaul providers and fiber and other wholesalers.
- Leverage public money when you can, such as e-Rate and become an expert in helping schools and others win funding that can be spent on access."

Courtesy of Bob Roland, V.P. Sales and Marketing

Who is Diode?

- Owned by Diller Telephone and operating in very rural Nebraska
- Provides free Internet access to city offices in exchange for tower rights
- Partners with local universities to educate population on the value of broadband
- Wireless broadband network covers over 10,000 square miles
- Services over 1,600 wireless broadband subscribers
- Deploying BreezeACCESS Complete Spectrum™

www.diodecom.net
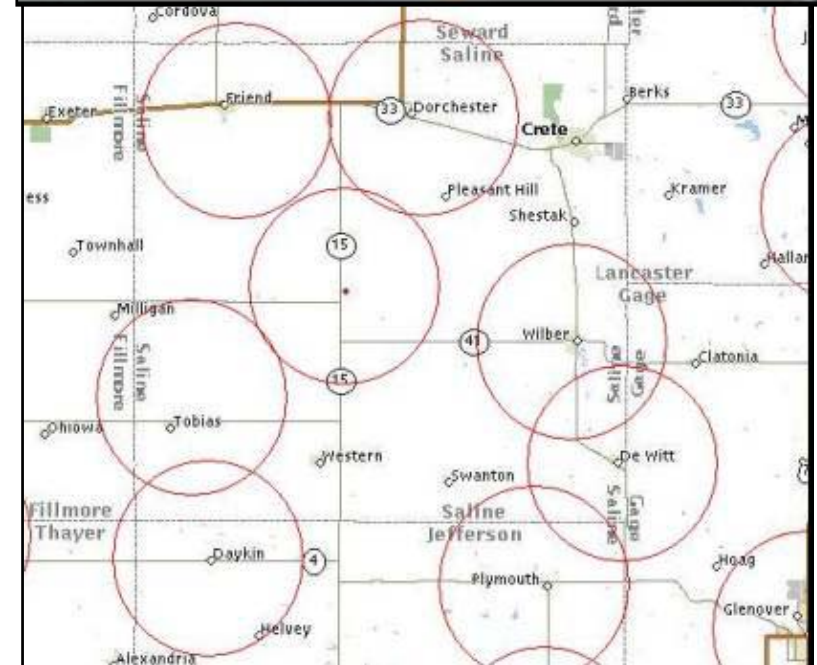
What Diode Sells

- 64k   to 128k - $39.95
- 128k to 256k - $49.95
- 256k to 384k - $59.95
- 384k to 512k - $79.95
- Larger packages available up to 36mbps depending on location and availability.

Additional services extra:

- Reporting $5/month
- Traffic shaping $5/month, $15 setup fee
- Virus service $1/month

(for more services, visit www.diodecom.net/valueas.htm)

Diode's Advice

- "Provide better customer service than your competitors. Offer 24/7 tech support with highly trained employees.

- Beef up your backbone: You need ample bandwidth and appropriate equipment on your backbone to support your end subscribers.

- Educate your customers on what to expect from the service your offer. In addition, emphasize the importance of security i.e. proper Anti-virus, Firewall protection, Hackers and Spyware etc.

- Know the importance of path studies and link budgets and how it can save hours of wasted time doing site surveys.

- Keep up to date with your equipment vendor(s) latest equipment, firmware upgrades and technical information."

Courtesy of Brad Pahl, Director of Broadband Services

Who is Owensboro Municipal Utilities?

- Largest municipally-owned water and power utility in Kentucky

- Extensive fiber optic deployments

- Over 1,900 wireless broadband subscribers

- Now leveraging regional utility relationships to expand beyond their service area

- Largest wireless broadband deployment by a municipal utility in the USA

- Competes locally with xDSL, cable, and other wireless

- Deploying BreezeACCESS Complete Spectrum™

www.omu.org/OMUOnline
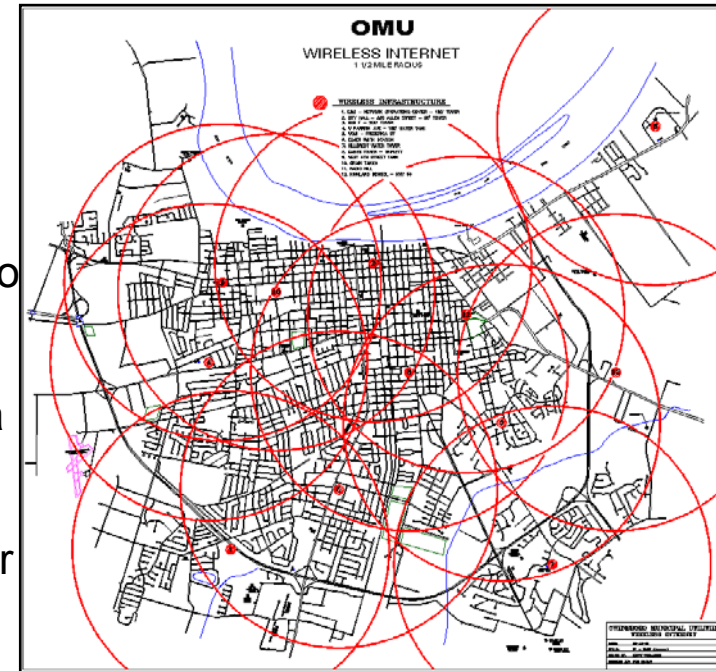
What OMU Sells

Residential

- Cost - $25 per Month
- 5 E-Mail Addresses
- Speed – Up to 512K Download, 128K Upload
- Service – 24 X 7 Call Center

Commercial

- 128K--$64/month
- 256K--$84/month
- 512K--$134/month
- 1.5M--$184/month
- 5 E-Mail Addresses
- Service – 24 X 7 Response

OMU's Advice

- "If you can afford it, sell to compete with dial-up and you will win against the broadband competition and have success making first time broadband customers.

- Have very clear long term subscriber goals, then build a plan to reach them. Stick to it.

- Celebrate your milestones with your employees, customers and community. Throw a party. It builds goodwill and gets free press.

- Slow and steady is better than fast and uncontrolled.

- Provide excellent service with a goal to always exceed expectations; that extra step is your best PR move."

Courtesy of Phillip Coleman, Director OMU Online

Who is Midwest Wireless?

Cellular Operator

- Top 20 US cellular carrier

- Over 350,000 cellular customers

- Providing wireless broadband to over 150 townships

- More than 3,000 wireless broadband subscribers

- 85% residential/15% commercial

- Over 100 broadband cell sites

- Deploying BreezeACCESS Complete Spectrum™

www.midwestwireless.com

What Midwest Sells - Residential

- Dynamic IP, 2 e-mail accounts*

Home 256 $44.99

Home 512 $59.99

Home 768 $99.99

   *Additional e-mail addresses: $2.00/month

Residential Plan Installation Fees

Month-to-Month $350.00

12 Month Agreement $200.00

24 Month Agreement $100.00

What Midwest Sells – Small Business

- Dynamic IP, 4 e-mail accounts*

Business 256 $74.99

Business 512 $149.99

Business 768 $199.99

*Additional e-mail addresses: $2.00/month

Small Business Plan Installation Fees

Month-to-Month $350.00

12 Month Agreement $200.00

24 Month Agreement $100.00

What Midwest Sells – Large Business

- Static IP, 10 e-mail accounts*

Static 256 $149.99

Static 512 $299.99

Static 1024 $499.99

   *Additional e-mail addresses: $2.00/month

Large Business Plan Installation Fees

Month-to-Month $450.00

12 Month Agreement $300.00

24 Month Agreement $150.00

Midwest's Advice

"1) Don't install marginal links.

 2) Knowledgeable RF engineers.

 3) Utilize all tools available to accomplish the business model (i.e. licensed frequencies, unlicensed frequencies, fiber, copper, cable, etc.).

 4) Reliable service is the best marketing.

 5) Decide where to build based on revenue not number of customers."

Courtesy of Jay Hanke, Wireless Data Engineer II

Who is Wabash Communications?

- Based in OH, Wabash was founded in 1905
- In 1993, formed consortium with 19 other ILECs to create "Brightnet" brand for advanced services
- Over 800 wireless subscribers
- Over 1,200 wireless subscribers in Brightnet group
- Deploying BreezeACCESS Complete Spectrum™

brightwireless
High Speed Internet Access

www.wabashtelephone.com
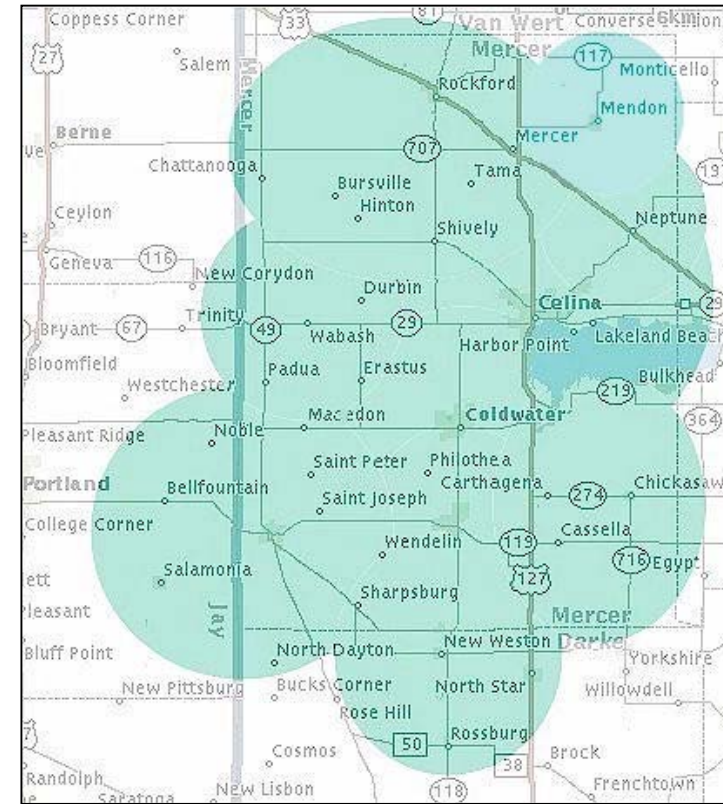
What Wabash Sells

All get mail, spam filter, virus protection, 25Mb web space, start page customization, 24/7 support

Service tiers:

- 512K Download 150K Upload - $45.00

- 384K Download & Upload - $50.00

- 768K Download & Upload - $65.00

- Full T-1 Download & Upload - $150.00

- Installation fee: $100, waived with 3-year agreement

Wabash's Advice

"1. Listen to the customer, they will tell you what they need. Give it to them and they will love you for it.

2. Make sure the installers complete a high quality install. We have a wireless competitor who's installers do shoddy work and who's service suffers as a result. We pick up their customers on a regular basis. High quality workmanship is also a tremendous PR tool.

3. Use quality equipment, after the install truck rolls cost money.

4. Don't skimp on your central (distribution) radio sites.

5. Strive for the five 9's of reliability.

6. Only install customers that have adequate quality signal. This may mean letting a few go, but bad word of mouth from an unhappy customer will kill you."

Courtesy of Mike Boley, Manager, Wireless Services
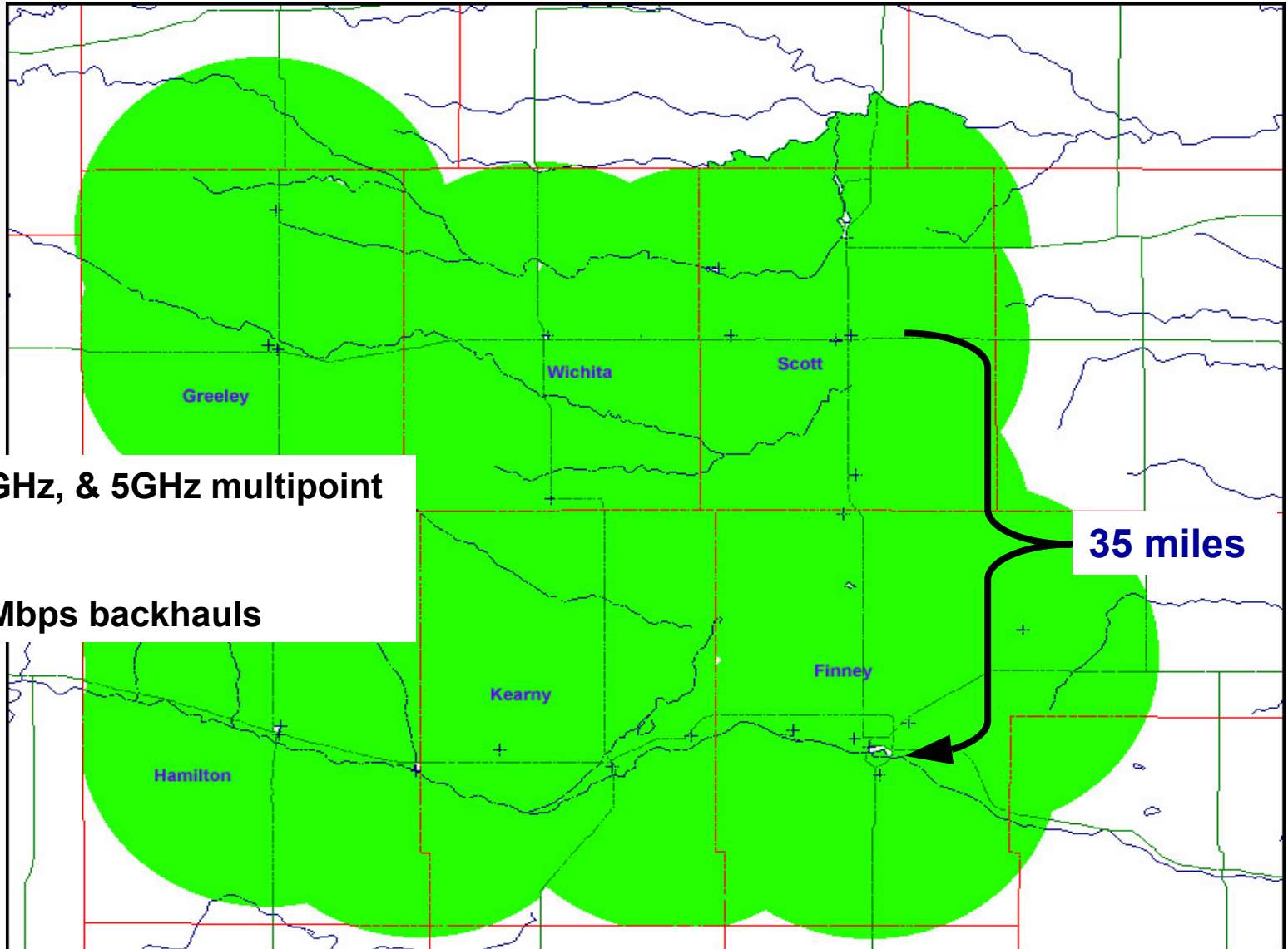
Who is Wheatland Broadband?

- Electric membership cooperative in western Kansas

- Serves 16,000 households with electric power

- Almost 2,000 wireless broadband subscribers in first 30 months

- Take rates as high as 35% per town

- Rolling out to cover entire 11 county footprint

- Largest wireless broadband deployment by a cooperative utility in the USA

- Competes locally with xDSL and cable

- Deploying BreezeACCESS Complete Spectrum™

www.wbsnet.org

Current Build Out

- **900MHz, 2.4GHz, & 5GHz multipoint**
- **29 cell cites**
- **14, 36, & 72 Mbps backhauls**

35 miles

What Wheatland Broadband Sells

- **$37/ Month**

  High Speed Internet Connection Always On, No Time Limit, 5 Email Accounts, 5Mb for Personal Web Site, 24X7 Customer Support and Speeds of Up to **512** Kbps

- **$57/ Month**

  High Speed Internet Connection Always On, No Time Limit, 10 Email Accounts, 10Mb for Personal Web Site, 24X7 Customer Support and Speeds of Up to **768** Kbps

- **$87/ Month**

  High Speed Internet Connection Always On, No Time Limit, 20 Email Accounts, 25Mb for Personal Web Site, 24X7 Customer Support and Speeds of Up to **1.0** Mbps

Additional Services

- $5/month Static IP Address
- $5/month Per 5 MB extra email space
- $2/month Each additional email account

Wheatland Broadband's Advice

"As far as my words of wisdom, well, I only have one and it is service. Its all about the service. You can have the best fastest, and problem free network in the world, but nobody cares if they can not talk to a person. Here, we are not fancy or smooth talking nor do we spout a line of BS that can be smelled over the feedlots. We tell it like it is and we have solved EVERY problem that has come up that we can control whether it is ours or the member/customer within 24 hours."

Courtesy of Jevin Kasselman, Director, Internet Services

Summary of Top Operator Advice
(Notice the common threads!)

- **Service is paramount!**

- **Know your customer!**

- **Use all the tools in the tool box!**

- **Build it right & with quality gear!**

- **Work all your relationships as real partnerships!**

Thank You….   *Questions?*